Claims

1. (Currently Amended) A system for monitoring exposure to impulse noise, comprising:

a sound-sensing device operable to sense impulse noise;

a storage module operable to store the waveform of the impulse noise sensed by the sound-sensing device;

a processor operable to calculate ~~one or more~~ plural noise parameters of the impulse noise from the waveform; and

a user interface program operable to allow a user to select one or more of said plural noise parameters and display said selected one or more noise parameters ~~selected by a user~~.

2. (Currently Amended) The system of claim 1, wherein the noise parameters that are calculated by the processor comprise ~~are selected from the group comprising~~ energy, spectral distribution, kurtosis, number of impulses, peak pressure level, rise time, duration, temporal spacing and Auditory Hazard Units.

3. (Currently Amended) The system of claim 1, wherein the user interface program has ~~one or more~~ plural graphical user interface elements that allow for user selection of said selected one or more of said noise parameters to be displayed by the user interface program.

4. (Original) The system of claim 1, wherein the sound-sensing device is operable to sense impulse noise levels having a peak pressure level greater than 146 dB.

5. (Original) The system of claim 1, wherein the processor calculates a corrected peak pressure level based on the number of impulses detected during a specified time period.

6. (Currently Amended) The system of claim 1, wherein the processor calculates energy flux according to the equation $E = \frac{1}{Z_0}\int_0^T p(t)^2 \cdot dt$, where Z_o is the acoustic impedance of air and $p(t)$ is the instantaneous acoustic pressure.

7. (Currently Amended) The system of claim 1, wherein the processor calculates kurtosis according to the equation $\beta(t) = m_4/(m_2)^2$,where m_4 is fourth moment of a spectral distribution of the impulse noise and m_2 is the second moment of the spectral distribution of the impulse noise.

8. (Original) The system of claim 1, wherein the processor calculates the duration of an impulse, wherein the duration comprises either the A-duration, B-duration, C-duration, or D-duration of the impulse noises.

9. (Original) The system of claim 1, wherein the sound-sensing device comprises a dynamic pressure sensor.

10. (Original) The system of claim 1, further comprising a hearing protector having an ear piece, the sound-sensing device being embedded within the ear piece.

11. (Original) The system of claim 1, further comprising an analog-to-digital converter operable to receive an analog signal representative of the impulse noise from the sound-sensing device and convert the analog signal into a digital signal, the analog-to-digital converter having a sampling rate of at least 200 KHz, and wherein the storage module stores the digital signal from the analog-to-digital converter.

12. (Currently Amended) A method for monitoring exposure to impulse noise, comprising:

detecting impulse noise;

recording an acoustic waveform of the detected impulse noise;

calculating ~~one or more~~ plural noise parameters of the detected impulse noise from the recorded waveform; and

selecting, via one or more user-interface elements, one or more of the plural noise parameters;

displaying the selected noise parameters; and

assessing the potential hazard of the impulse noise through analysis of the selected noise parameters.

13. (Currently Amended) The method of claim 12, wherein calculating plural noise parameters comprises calculating ~~the noise parameters are selected from the group comprising~~ energy, spectral distribution, kurtosis, number of impulses, peak pressure level, rise time, duration, temporal spacing and Auditory Hazard Units from the recorded waveform.

14. (Original) The method of claim 12, comprising detecting impulse noise levels having a peak pressure level greater than 146 dB.

15. (Original) The method of claim 12, comprising calculating the peak pressure levels of the detected impulse noise and calculating corrected peak pressure levels to account for the number of impulses detected during a specified time period.

16. (Currently Amended) The method of claim 12, comprising calculating energy flux from the recorded waveform according to the equation $\cancel{E = \frac{1}{Z_0}\int_0^T p(t)^2 \cdot dt\left[J/m^2\right]}$

$E = \frac{1}{Z_0}\int_0^T p(t)^2 \cdot dt$, where Z_o is the acoustic impedance of air and $p(t)$ is the instantaneous acoustic pressure.

17. (Currently Amended) The method of claim 12, comprising calculating kurtosis from the recorded waveform according to the equation $\beta(t) = m_4/(m_2)^2$, where m_4 is fourth moment of a spectral distribution of the impulse noise and m_2 is the second moment of the spectral distribution of the impulse noise.

18. (Original) The method of claim 12, comprising calculating the A-duration, B-duration, C-duration, or D-duration of a detected impulse.

19. (Original) The method of claim 12, further comprising displaying a time-varying graph of the recorded waveform.

20. (Original) The method of claim 12, comprising detecting impulse noise with a dynamic pressure sensor.

21. (New) A method for monitoring exposure to impulse noise, the method comprising:

detecting multiple sound impulses during a specified period of time;

determining the peak pressure level of the detected impulses; and

calculating a corrected peak pressure level for at least one of the detected impulses based on the number of impulses detected during the specified period of time.

22. (New) The method of claim 21, wherein the act of detecting multiple impulses during a specified period of time comprises detecting impulses having peak pressure levels greater than a predetermined value.

23. (New) The method of claim 21, further comprising displaying the number of detected impulses.

24. (New) The method of claim 21, further comprising calculating kurtosis for a plurality of said impulses according to the equation $\beta(t) = m_4/(m_2)^2$,where m_4 is fourth moment of a spectral distribution of the plurality of impulses and m_2 is the second moment of the spectral distribution of the plurality of impulses.

25. (New) An apparatus for monitoring exposure to impulse noise, comprising:

a sound-sensing device operable to sense impulse noise; and

a processor operable to calculate the peak pressure level of impulses sensed by the sound-sensing device and operable to calculate a corrected peak pressure level of an impulse based on the number of impulses sensed in a specified period of time.

26. (New) The apparatus of claim 25, wherein the sound-sensing device is operable to sense impulse noise levels having a peak pressure level greater than 146 dB.

27. (New) The apparatus of claim 25, wherein the sound-sensing device comprises a piezoelectric pressure sensor.

28. (New) The apparatus of claim 25, wherein the processor is operable to calculate the following noise parameters of an impulse noise sensed by the sound-sensing device: energy, spectral distribution, kurtosis, number of impulses, peak pressure level, rise time, duration, temporal spacing and Auditory Hazard Units.

29. (New) The apparatus of claim 25, further comprising a computing device having a user interface program operable to allow a user to select one or more of said noise parameters and display said selected one or more noise parameters.